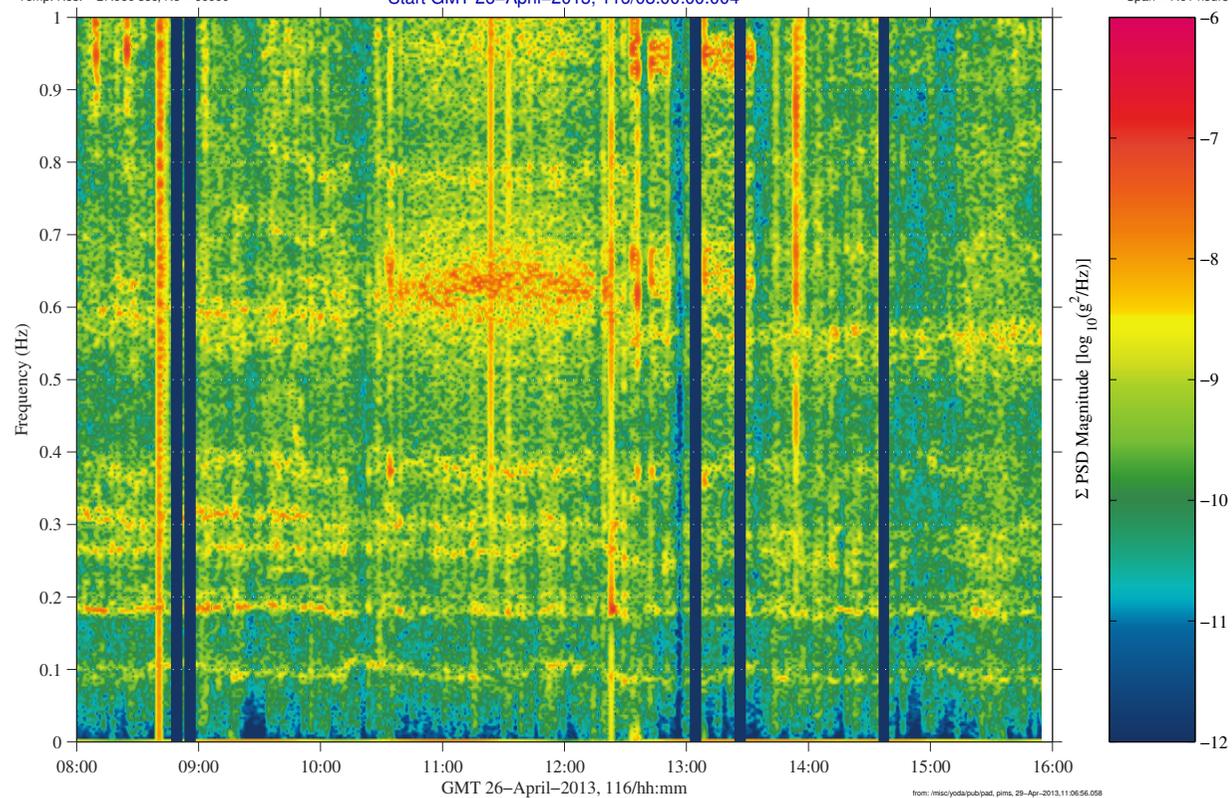
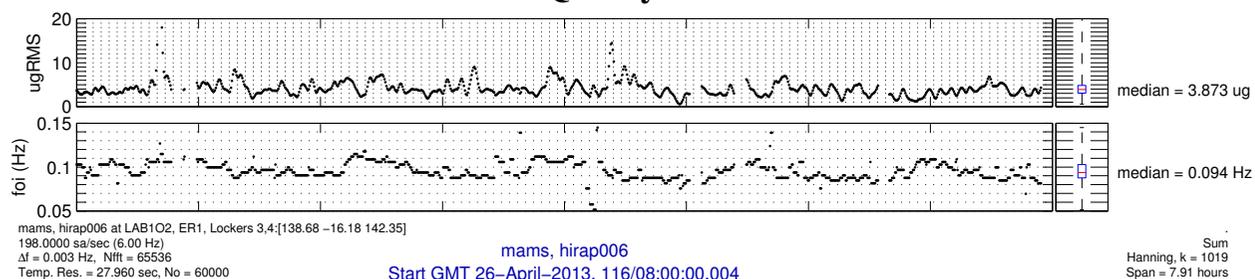


## Progress 51P Docking Qualify



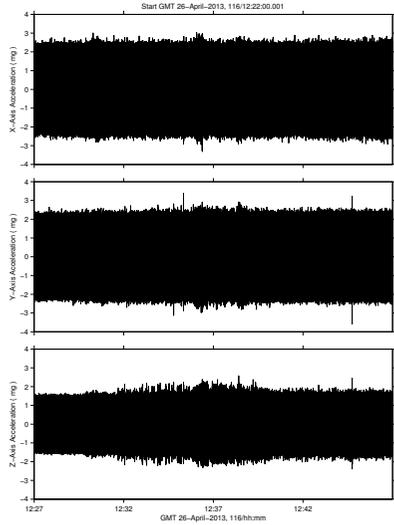
Description	
Sensor	HiRAP 198 sa/sec (6 Hz)
Location	LAB102, ER1, Lockers 3,4
Plot Type	spectrogram ( $\Sigma$ ); $f < 1$ Hz

### Notes:

- The Progress 51P vehicle docked with the ISS on GMT 26-Apr-2013 at about 12:37.
- This spectrogram shows the transient impact of the contact event as a orange-to-red vertical streak at the time of docking. Note the elevated structural excitation from this vehicle-to-vehicle impact as the horizontal red streak starting at time of contact, particularly between about 0.2 and 0.3 Hz.
- See some interesting ancillary information on last page.

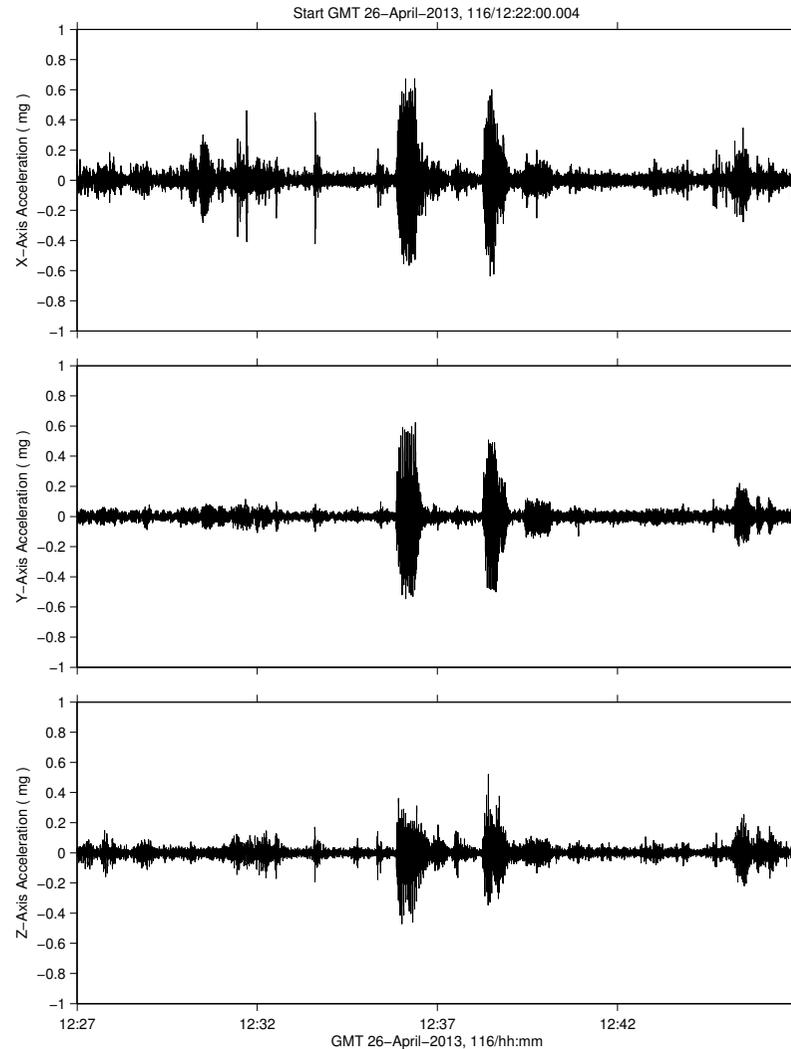
Regime:	Vibratory
Category:	Vehicle
Source:	Progress 51P Docking





## Progress 51P Docking Quantify

mams\_hirap006 at LAB102, ER1, Lockers 3,4 {138.68 -16.18 142.35}  
 198.0000 sa/sec (6.00 Hz) MAMS\_HIRAP, hirap006, LAB102, ER1, Lockers 3,4, 6.0 Hz (198.0 s/sec) SSAnalysis[0.0 0.0 0.0]



Description	
Sensor	HiRAP 198 sa/sec (6 Hz)
Location	LAB102, ER1, Lockers 3,4
Plot Type	Acceleration vs. time

### Notes:

- The smaller acceleration versus time plot at the upper left shows HiRAP data measured at its native cut-off frequency of 100 Hz. Note no distinctive features around the time of the Progress 51P docking event at GMT 26-Apr-2013,12:37.
- The larger acceleration versus time plot at the lower right shows HiRAP data filtered at 6 Hz. This reinforces what was shown on the spectrogram of the first page that the impact of this Progress docking was primarily contained at these lower frequencies.
- See some interesting ancillary information on last page.

Regime:	Vibratory
Category:	Vehicle
Source:	Progress 51P Docking



## Progress 51P Docking Ancillary Information

The Progress 51P docked to the aft docking port of the Zvezda Service Module at approximately GMT 26-Apr-2013, 12:37. Due to the failure of the deployment of one of the spacecraft's Kurs antennae, a software patch was sent up from Russian controllers to bypass restrictions on the Kurs approach. The manual TORU system was on standby with cosmonauts Roman Romanenko and Pavel Vinogradov on the controls in case of a Kurs failure. However, the automated rendezvous and docking operation procedures using the Kurs docking system aboard the ISS and the Progress was successful, although the docking velocity was slower than normal to give engineers a good look at the antenna through the space station's camera system. At the time of docking the ISS and Progress 51P were orbiting 261 miles above the Kazakhstan-China border. The Expedition 35 crew opened the hatches and entered the Progress later in the day.



*The Progress 51P Cargo Ship Approaches the Zvezda Module of the ISS*

